

AGRICULTURE MECHANICS I

Curriculum Content Framework

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Curriculum Content Framework

AGRICULTURE MECHANICS I

Grade Levels: 10, 11, 12
Course Code: 491100

Prerequisites: Agriculture Science and Technology

Course Description: This course connects scientific principles with mechanical skills. This course will enhance the student's understanding of the traditional areas of agriculture mechanics.

Table of Contents

	Page
Unit 1: Introduction to Agriculture Mechanics	1
Unit 2: Safety Precautions in Agriculture Mechanics	3
Unit 3: Arc Welding	5
Unit 4: Small Gas Engines	7
Unit 5: Agriculture Graphics	8
Unit 6: Tool Maintenance	9
Unit 7: Plumbing	10
Unit 8: Woodworking	11

Unit 1: Introduction to Agriculture Mechanics

10 Hours

Terminology: none

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.1 Discuss the role of agriculture mechanics in the agricultural industry		Foundation	Speaking	Asks questions to clarify information [1.5.3] Asks questions to obtain information [1.5.4]
		Personal Management	Organizational Effectiveness	Comprehends the organization's modes of operation [3.3.5]
1.2 Identify careers in agriculture mechanics	1.2.1 Research a career in agriculture mechanics to determine educational requirements, working conditions, and salary	Foundation	Reading	Applies information to job performance [1.3.4] Uses standard occupational resource materials [1.3.22]
		Personal Management	Career Awareness, Development, and Mobility	Explores career opportunities [3.1.6] Identifies continuing changes in male/female roles at home and work [3.1.7] Identifies education and training needed to achieve goals [3.1.8]

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.3 List FFA opportunities available to students interested in agriculture mechanics		Foundation	Writing	Organizes information into an appropriate format [1.6.10]
		Interpersonal	Teamwork	Comprehends ideas and concepts related to FFA activities [2.6.1]
				Takes an interest in what others say and do [2.6.5]

Unit 2: Safety Precautions in Agriculture Mechanics

10 Hours

Terminology: Combustion, Extinguish, Noise intensity

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
2.2 Identify the most frequent cause of accidents in the agriculture mechanics lab		Foundation	Listening	Comprehends ideas and concepts related to agriculture mechanics [1.2.1]
		Thinking	Creative Thinking	Makes connections between seemingly unrelated ideas [4.1.6]
2.3 List precautions that may be taken to prevent accidents in the lab	2.3.1 Develop a safety plan for your school's agriculture mechanics lab	Foundation	Listening	Receives and interprets verbal messages [1.2.8]
		Thinking	Decision Making	Considers risks when making a decision [4.2.3]
2.4 Identify safety colors associated with the agriculture mechanics lab		Foundation	Listening	Receives and interprets verbal messages [1.2.8]
		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]
2.5 Explain how fires and fire extinguishers are classified	2.5.1 Explain the proper use of a fire extinguisher	Foundation	Science	Applies life-saving techniques [1.4.4]
		Thinking	Knowing How to Learn	Applies new knowledge and skills to agricultural structures [4.3.1]

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.6 Discuss basic first aid treatment for burns and cuts		Foundation	Science	Applies life-saving techniques [1.4.4]; observes health code/sanitation requirements [1.4.19]
		Personal Management	Responsibility	Pays close attention to details [3.4.8]

Unit 3: Arc Welding 15 Hours

Terminology: Alternating current, Direct current, Penetration

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
3.1 Define arc welding terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
3.2 Identify practical uses of arc welding	3.2.1 Label the parts of an AC and DC arc welder	Foundation	Reading	Adjusts reading strategy to purpose and type of reading (skimming and scanning) [1.3.1]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
3.3 Identify different types of metals		Foundation	Science	Describes/Explains scientific principles related to metals [1.4.14]
		Thinking	Knowing How to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
3.4 Compare the different types of electrodes		Foundation	Science	Solves practical problems using scientific methods and techniques [1.4.23]
		Thinking	Decision Making	Demonstrates decision-making skills [4.2.4]

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
3.5 List the steps in striking an arc	3.5.1 Practice safety precautions related to arc welding	Foundation	Listening	Listens to follow directions [1.2.6]
	3.5.2 Demonstrate the ability to run a simple bead		Writing	Summarizes written information [1.6.17]
	3.5.3 Demonstrate the four basic welding positions			
	3.5.4 Demonstrate welding joints			
	3.5.5 Construct a simple metal project			

Unit 4: Small Gas Engines

15 Hours

Terminology: Four-cycle engine, Stroke, Top Dead Center

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
4.1 Define small gas engine terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
4.2 Identify uses of small gas engines in agriculture		Foundation	Reading	Comprehends written information for main ideas [1.3.7]
4.3 Match tools used in small gas engines to their functions		Foundation	Speaking	Applies/Uses technical terms as appropriate to audience [1.5.2]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.4 Distinguish between a two-stroke and a four-stroke engine	4.4.1 Practice safety precautions associated with small gas engines	Foundation	Reading	Locates pertinent information in documents such as manuals, graphs, and schedules to perform tasks [1.3.18]
	4.4.2 Disassemble a small gas engine	Thinking	Seeing Things in the Mind's Eye	Imagines the flow of work activities from narrative descriptions [4.6.1]
	4.4.3 Reassemble a small gas engine			Visualizes a system's operation from schematics [4.6.3]
	4.4.4 Adjust the carburetor			
	4.4.5 Service the ignition system			
	4.4.6 Service the fuel system			

Unit 5: Agriculture Graphics 10 Hours

Terminology: Border line, Sketch, Title block

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.1 Define agriculture graphics and sketching and drawing terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
5.2 Discuss the importance of agriculture graphics and sketching and drawing to agriculture mechanics		Foundation	Listening	Listens for content [1.2.3] Listens to follow directions [1.2.6]
		Personal Management	Organizational Effectiveness	Identifies characteristics desired by organization [3.3.6]
5.3 Identify tools used in agriculture graphics and sketching and drawing and the functions of those tools		Foundation	Reading	Identifies relevant details, facts, and specifications [1.3.16]
		Thinking	Reasoning	Extracts rules or principles from written information [4.5.4]
5.4 Explain the process of a mechanical drawing	5.4.1 Demonstrate the correct use of an architect's scale	Foundation	Arithmetic/Mathematics	Draws to scale [1.1.20]
	5.4.2 Create a sheet layout and title block			Makes precision measurements using an architect's scale [1.1.27]
	5.4.3 Construct balanced drawings of the following types: orthographic, isometric, oblique	Personal Management	Responsibility	Maintains a high level of concentration in completion of a task [3.4.7]
	5.4.4 Construct a set of scale plans			Pays close attention to details [3.4.8]

Unit 6: Tool Maintenance 10 Hours

Terminology: Mushroomed, Tempered, Whet

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
6.1 Define tool fitting terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
6.2 Discuss tool fitting in agriculture mechanics		Foundation	Reading	Applies information to new situations [1.3.5]
		Thinking	Creative Thinking	Makes connections between seemingly unrelated ideas [4.1.6]
6.3 Identify tools used in tool fitting and their functions	6.3.1 Practice safety precautions associated with tool fitting	Foundation	Writing	Uses technical words and symbols [1.6.20]
	6.3.2 True a grinding wheel	Personal Management	Responsibility	Exerts a high level of effort and perseverance toward goal attainment [3.4.4]
	6.3.3 Construct a center punch from round stock			
	6.3.4 Sharpen a cold chisel, twist drill, and lawn mower blade			Pays close attention to details [3.4.8]

Unit 7: Plumbing

10 Hours

Terminology: Fitting, Galvanized, Valve

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
7.1 Define terms for plumbing		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
7.2 Explain the importance of knowing basic plumbing skills		Foundation	Writing	Organizes sentences into paragraphs [1.6.11]
		Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
7.3 Identify tools used in plumbing and their functions	7.3.1 Demonstrate the process of cutting and flaring copper tubing	Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
	7.3.2 Demonstrate the process of cutting and sweating copper tubing	Thinking	Problem Solving	Identifies possible reasons for problem [4.4.6]
	7.3.3 Demonstrate the process of cutting and gluing PVC pipe			Interprets drawings to solve design problems [4.4.7]
	7.3.4 Demonstrate how to thread and fit steel pipe			

Unit 8: Woodworking

10 Hours

Terminology: Chamfer, Grain, Rabbet

CAREER AND TECHNICAL SKILLS What The Student Should Be Able To Do		ACADEMIC AND WORKPLACE SKILLS What The Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
8.1 Define woodworking terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
8.2 Discuss the use of woodworking in agriculture mechanics		Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5] Speaks effectively using appropriate eye contact, gestures, and posture [1.5.11]
8.3 Identify woodworking tools used in agriculture mechanics and their functions	8.3.1 Practice safety precautions associated with woodworking tools 8.3.2 Demonstrate the use of a claw hammer 8.3.3 Use a crosscut and rip saw correctly 8.3.4 Demonstrate the correct use of a wood plane 8.3.5 Use a wood chisel correctly 8.3.6 Complete a woodworking skills board	Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]

Glossary

Unit 1: Introduction to Agriculture Mechanics

No terms

Unit 2: Safety Precautions in Agriculture Mechanics

1. Combustion – burning
2. Extinguish – to put out a fire by cooling, smothering, or removing fuel
3. Noise intensity – energy in the sound waves

Unit 3: Arc Welding

1. Alternating current – current that reverses its direction 60 times per second
2. Direct current – current that flows in one direction continuously
3. Penetration – distance from the original surface of the base metal to that point at which fusion ceases

Unit 4: Small Gasoline Engines

1. Four-cycle engine – an engine with four strokes per cycle
2. Stroke – the movement of a piston from top to bottom or from bottom to top
3. Top dead center – position of the piston at its highest point

Unit 5: Agriculture Graphics

1. Border line – heavy black line drawn close to the outer edge of paper used for drawing plans
2. Sketch – a rough drawing of an idea, object, or procedure
3. Title block – the section of a drawing reserved for information about the drawing in general

Unit 6: Tool Maintenance

1. Mushroomed – a spread or pushed-over condition caused by being struck repeatedly
2. Tempered – to heat a piece of tool steel followed by controlled cooling so as to control the degree of hardness
3. Whet – to sharpen by rubbing on a stone

Unit 7: Plumbing

1. Fitting – a part used to connect pieces of pipe or to connect other objects to pipe
2. Galvanized – coated with zinc for rust resistance
3. Valve – a devise that controls the flow of water and gas

Unit 8: Woodworking

1. Chamfer – cutting down of a corner between the edge and face of a board
2. Grain – lines on lumber caused by the annual rings of the wood
3. Rabbet – a cut or groove at the end of a board made to receive another board and form a joint